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Y OUT AND EQUIPMENT OF PLAYGROUNDS

National recreation association

Layout and Equipment of Playgrounds

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IN preparing this handbook on the layout and equipment of playgrounds, the Playground and Recreation Association of America has attempted to bring together the information which has been issued in pamphlets and other publications, and to make it available for ready use in one handbook.

Stressing the subject of equipment in this manner in no way minimizes the importance of leadership. Apparatus does not comprise a playground; without leadership, equipment is worse than useless. When properly used, however, it stimulates desirable motor activities, and provides channels for play which are exceedingly valuable. For this reason, it is worthy of careful consideration.

CHAPTER I

General Considerations

SOME of the factors having to do with the laying out and equipping of a playground are as follows:

Location

In planning the location of a playground the question of the future development of the neighborhood—whether industrial or residential—should be considered. The sections in which there is the most distinct need should be determined and also the locations which can be most easily reached by the greatest number of children who should be served by playgrounds. They should, many feel, be provided within a quarter-mile radius of the homes of the younger children. Children from six to twelve will go as far as half a mile to the playground.

Size

The size of the playground is usually determined by the amount of land available, the cost, and the number of children to be accommodated. For two hundred and fifty children under ten years of age, half an acre will do, if

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no more space is available—but two acres is much more desirable, and the usual grounds vary between these two limits. Some people feel that to have three hundred children playing at the same time on one acre, allowing one hundred forty square feet per child—a space about twelve feet square—represents a point of saturation.

Many communities attempt to secure numerous grounds for little children—that is, one in each neighborhood, sometimes in connection with schools.

For children over ten years of age the grounds need not be so numerous, but must be larger. From two to four acres is the minimum, especially if baseball is to be played, and ten- to twenty-acre grounds, such as are found in the park systems of Chicago are most desirable.

Fencing of Grounds

Fencing, in the majority of cases, is felt to be a necessity. It limits liability for accidents since under the ruling of most courts if the gates are locked, authorities are not held responsible. It reduces problems of discipline and safeguards the ground and apparatus. It also gives individuality to the playground. There are a number of different kinds of fences which may advantageously be provided—the steel picket fence with steel posts set in concrete; the woven-wire fence with reinforced concrete or wooden posts and a top and bottom rail measuring from six

to eight feet in length between posts, and the evergreen hedge of privet and box shrubs. Playground fences average between four and eight feet in height. The appearance of any fence will be greatly improved if it is covered with honeysuckle, flowering vines or rambler roses.

Surfacing

The problem of surfacing is one which causes a great deal of difficulty and gives rise to much discussion. No surfacing has as yet been devised which has proved itself to be ideal or which is satisfactory for every ground. Soil conditions in the various parts of the country are important factors in determining what the surface must be, and there is no guarantee whatever that a process which has been successful in one city will prove satisfactory in another section of the country.

In planning surfacing the following points must be considered: suitability for use, cost, durability and maintenance. Playground surfacing should be soft and porous, yet firm enough for players to run and romp about on without digging holes in it when it is wet, and raising clouds of dust when it is dry.

The grading of a playground field will depend upon a specific problem. If the field is going to be used in the winter time, the field should be what is known as a depressed field with a low point in the center of the field and with a number of catch basins to catch the water, these

catch basins, of course, being connected with sewers, or drain pipes. The pitch or grade should not be less than six inches for every hundred feet. In some play fields the problems involved may make it more advantageous to have the center of the field the high point and the fall toward the outside of the play field. With a grade of this kind, the field can scarcely be used for skating purposes, for there will be difficulty in flooding such a field.

Very frequently play fields become soft and muddy and continue for some few days in this condition because of inadequate and sluggish drainage. Water from rainfall must not stand on the play fields for any length of time, and therefore adequate drainage is imperative. The drain pipe leading away from the catch basins should never be smaller than six inches and very frequently should be eight or ten.

Grass makes the most desirable surfacing for children's play, but oftentimes it is not practicable. Various types of early and late maturing grasses have been combined for golf courses, terraces and much-used lawn surfacing by horticulturists. By mixing grasses of various length roots a deep turf is formed and the grasses coming to full foliage in rotation keep the sward green throughout the season. A list of grass seed dealers may be secured by writing to the Playground and Recreation Association of America, 1 Madison Avenue, New York City.

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Sometimes oil has been used in an attempt to produce a satisfactory surface. Cinder has also been tried but is not generally recommended. Sandy loam or a mixture of sand and clay makes a satisfactory surface in some sections. This requires sprinkling with water in dry weather.

The types of surfacing so far found most successful in Philadelphia and Chicago are quoted below :

In Philadelphia "the entire plot, with such exceptions as were required in each individual case, was graded to a sub-grade of ten inches below the finished grade. The surface so made was carefully, although not accurately, leveled and compacted by rolling with a steam-roller of not less than five tons in weight. After the soil or waste material resulting from this grading was disposed of, sufficient cinders were spread over the surface to insure, when rolled with a heavy roller, a thickness of seven inches. The cinders were thoroughly wet before and during the rolling process. It was found that the rolling could be done in one layer. To this surface a layer of stone screenings was added, which, having been rolled and brought to the surface to the grades given by the surveyor, had a thickness of three inches. As in the case of the cinders, the stone screenings must be thoroughly wet before and during rolling. This plan, recently adopted by the Philadelphia authorities, will eliminate the use on the playground surfaces

of glutrin, tasscoil or similar artificial dressings as dust-layers, and will rely on a system of sprinkling with water to lay the dust. In order to make this method of dust-laying effective the playgrounds are piped and arrangements made so that sprinkling may be done whenever necessary."

In Chicago excavation was carefully made with reference to character of subsoil in an effort to secure good drainage. If subsoil of sticky clay was discovered, cinders twelve inches deep were first applied to the excavated surface. If a sandy subsoil was discovered, cinders to the depth of only four inches were needed. The cinders were then rolled and packed. Upon the well-rolled cinders was placed a layer of stone two inches deep, the stones measuring from one-half to one and one-quarter inches in diameter. The stone, like the cinders, was then well rolled.

Upon the stone was placed a layer of yellow clay with a sufficient sand content—about 33 per cent — to rub off somewhat easily when thoroughly dry; this was then rolled to a depth of about two inches and torpedo sand spread over the top. Torpedo sand is a name for crushed granite screenings which have passed through screens to a size of one-sixteenth to one-eighth inch, or fine gravel the same size.

Because of their expense, these types of surfacing may not be practicable for all communities. The method given below, however, is de-

scribed by one authority as being within the reach of any average city:

If the sub-grade is handled giving the pitch desired for the finished grade, and six inches of cinders spread over the entire surface, a very porous upper surface will result, which in itself will seek to draw moisture from the upper surface. These cinders should be rolled with a roller of not less than five tons. This layer of cinders should be covered with a three or four-inch layer of clay loam; it is usually possible to find this particular loam in every section. It has more sand than clay in its composition; it somewhat resembles molders' sand. On top of this can be spread perhaps a quarter of an inch of screened torpedo sand. In the initial construction of the field, an adequate amount of loam is very essential. This surface may be treated with oil or calcium chloride if desired. It must be borne in mind, however, that if lime is used, calcium chloride cannot be used; either the oil or calcium chloride acts as a binder, but more particularly a dust layer. This top dressing of screened torpedo sand is something which must be handled as a part of the maintenance, adding a part every now and then, depending upon the amount of play on the field. If it is impossible to go to the expense of sub-grading and covering the field with six inches of cinders, grading alone with the proper treatment of screened torpedo sand will give a good surface

for a playground if the ground is of the right texture.

Beautifying the Grounds

In planning playgrounds for children the element of beauty is too often overlooked. It is quite feasible to have trees and flowers which will add to the beauty of the grounds and have educational and esthetic values for the children.

If, for example, the entrance to the ground is the beginning of a path, a few barberries will help keep the children in the path and will put at the threshold of the playground a little splash of color, which, with berry and leaf, will be beautiful all the year round. Instead of posts, it will be possible to have pyramidal arbor-vitæ on either side of the entrances, or morning-glories can climb a fine-wire netting and so form an arch of beauty inviting entrance to the ground.

The boundaries of the plot do not need to be bare wall or fence. As has been suggested, in some instances a hedge in mixed shrub planting can take the place of a fence. Disagreeable boundaries, such as old sheds, may be screened by planting; and a bare wall can be quickly clothed with Boston Ivy (*Ampelopsis tricuspidata*).

Close against the buildings there might be space for some bright flowers—possibly a little band of formal gardening could be arranged there. It is not necessary, however, to be de-

pendent for flowers upon the annuals or perennials of the formal garden. Among the shrubs there may be lilacs, bridal wreath, deutzia, dogwood, rhododendrons and azalias, if they will grow, and roses, sumac and hawthorn. Window-boxes may well be provided in connection with the buildings.

Shade

On the grounds there should be some trees to add beauty and shade. Shade should be provided most amply for the little children and for the older girls who are unable to endure the direct rays of the sun as the boys can. Where there is a wading-pool there may be a pergola on one side or end, making a shady place where mothers can sit. Boys and girls will never seek the hottest, sunniest place in town to play, and the shade of trees will add greatly to the attractiveness as well as the beauty of the playground.

CHAPTER II

The Laying Out of the Individual Playground

BEFORE discussing the problem of laying out and suitably equipping the various divisions of the individual playground, the fact should be emphasized that the most important element of the equipment is a good play-leader. An active, enthusiastic leader can make a playground without equipment many times as attractive as one having costly equipment and a poor leader or no leader at all. Space, cost and suitability are the factors which must be considered in choosing apparatus. It is not necessary, however, to buy all the apparatus at once. It is far better to provide a good leader and a minimum equipment of game supplies at the outset and then add apparatus from season to season.*

The relative importance of the various pieces of equipment is a matter which has been much discussed. One authority suggests the

*The community athletic kits which are available at reasonable cost from the A. J. Reach Co., Philadelphia, Pa., and also from A. G. Spalding and Bros., Chicopee, Mass., may be of interest in this connection. These kits contain balls, bats, nets and other game equipment, packed in a small box which may be easily carried from place to place.

following order in providing equipment for a playground: 1) Wading-pool and sand court; 2) Traveling rings for both boys and girls, and for boys a teeter ladder, climbing poles, sliding poles, horizontal bar, horizontal ladder, flying rings; 3) giant strides; 4) swings; 5) teeters; 6) slide. Another authority has suggested that in the development of a playground, swings, teeters and a sand-box be supplied the first year, adding the wading-pool, shelter-house and drinking fountains, if possible; for the second year, he suggests slides and giant strides and the wading-pool, shelter-house and drinking fountains, if they have not been previously provided; and for the third year's purchase he recommends the outdoor gymnasium. Suggested plans for laying out playgrounds may be found in the appendix.

The Three-Part Division

The best division of playgrounds is felt to be the so-called three-part division—one part for boys and girls under ten years of age, one for boys over ten, and one for girls over ten. A row of good shade trees between the children's and the girls' playground is suggested as a suitable line of demarcation between the two sections. It is possible to provide play spaces on a basis of attendance records, activities and ages. As a general rule boys require a greater amount of space than either little children or girls because of their activities. Small children should,

in all probability, be considered next, as they are likely to come to the playground in greater numbers than the older girls. A good arrangement, some authorities think, is to give one-half of the area to the boys and the other half to the older girls and small children, dividing the area between the small children and girls according to attendance records and the development of activities among the older girls.

The Small Children's Playground

The play space for small children should be in some secluded corner, out of the way of stray balls, where the children will not be disturbed by the older ones. Equipment for a small children's playground generally consists of sand-boxes, swings, including hammock or chair-swings, for the youngest children, slides, see-saws and a wading-pool. It is best to have the sandboxes in the shade under or around a tree or alongside a building. Pails, with eyes for handles set below the rim, and flat-handled, galvanized-iron spoons, to be used as shovels, are valuable additions to the sandbox. Blocks are often provided in connection with the sand play.

Oftentimes a circular wading-pool is surrounded by a sand court and covered with a pergola extending on the *southern* semi-circle. By this means, every part of the sand court is exposed to sunlight at some hour of the day.

Seats should be provided under the pergola for mothers. When there are trees affording sufficient shade the pergola may be discarded in favor of a pool located where the trees shade the sand court. If there are no trees, shelters and rolling canvas awnings should be directly over the sand piles and equipment for quiet games. A separate arbor of vines in the form of a play-house and quiet hour spot is suggested as a valuable addition to the other equipment. Kudsu is probably the most rapidly-growing vine, though Virginia creeper grows very rapidly and is hardy nearly everywhere.

Swings are usually placed in a secluded corner, which is sometimes fenced off, thus avoiding the danger of children being hit while playing games.

Playground for Larger Girls

This area should be totally enclosed with shrubbery so that the girls may feel perfectly secure from any sort of intrusion.

The usual apparatus selected for the larger girls' area consists of swings, see-saws, slides, giant strides and traveling-rings. Some authorities add to the above climbing-poles, horizontal bars and ladder, flying-rings, jumping-standards and a vaulting-horse. Such apparatus is helpful in muscle-building, but should be used under the direction of a competent instructor. In addition to whatever other apparatus is provided, an

ample supply of balls, bats, nets, goals, quoits, ring-toss and other similar apparatus for games and plays should be supplied.

All heavy apparatus should be arranged along the border, leaving the center for group and team games, folk-dancing and similar activities. If the apparatus is placed about ten feet from the edge of the lot, there will be room for a grass border and for a few benches. Swings should be placed far enough away from the fence so that the children will not strike it when swinging. The corner is one of the best places for the giant stride, as it is then out of the way and no space is wasted.

One authority suggests providing a wooden platform for dancing and games. It should occasionally be treated with raw linseed oil applied hot. A graphophone for teaching folk dancing is also a desirable asset.

The only equipment which is absolutely necessary for the game of *handball* is a fairly high wall and a ball. The side of a building will do for the wall. Oftentimes a flooring of white pine, well supported by beams closely laid, is provided. This game is suitable for either boys or girls and has increased greatly in popularity during recent years. A volley ball court should be laid out on the girls' playground. Although there is some discussion as to the value of the game of basketball for girls, where there is adequate supervision it is generally felt that a basketball

court should also be provided. The long dimensions of such courts should run north and south.

The volley ball court should be outlined by distinct lines at least two inches wide. The maximum dimensions are sixty feet by thirty feet. A smaller court is permissible and desirable for young players. Side and end lines must be three feet from any obstruction. A net two feet wide is stretched taut across the center with the upper edge seven and one-half or eight feet from the ground. Special fixtures for holding the net and combination volley ball and tennis posts and space have worked well in some cases.

The line game of basketball is not as strenuous as the regular game and therefore is more suitable for girls.

The basketball (line game) court is 100 feet by sixty feet. At a third of the distance from each end is drawn a field line parallel to the end lines, thus forming the home, center and guard sections. If the court is less than 2,500 square feet in area it may be divided in two equal sections. A goal is placed in the center of each end line. This consists of an iron ring eighteen inches in diameter, to which is hung a net, open at the bottom, the rim being ten feet above the ground. If the basket is not placed on a wall or building, there should be a backstop six feet wide and four feet high extending three feet above the basket with the rim of the basket six inches in front of the backstop. The free throw line

is drawn fifteen feet in front of each goal parallel to the end line. The free throw lane is six feet wide and is formed by lines starting from the end line three feet on each side of its center and extending twelve feet toward the center of the court. At the inner ends they intersect the arc of a circle with a six-foot radius, the center of which is the center of the free throw line. The center circle is drawn with a one-foot radius in the exact center of the field.

Playground for the Larger Boys

The usual apparatus selected for the boys' area is much like that for the larger girls, consisting of slides, swings, see-saws, giant strides and traveling-rings, and such apparatus for games and plays as balls, bats, nets, goals and quoits. Besides these, many authorities recommend the outdoor gymnasium, with flying-rings, climbing-ropes and poles, slanting and vertical ladders and horizontal bars, and also apparatus to supply the boys' athletic needs, such as vaulting standards and poles, high-jump standards and crossbars, shot-put rings and hurdles to be used upon the running track. Space and money will, of course, determine somewhat the amount of such equipment which can be provided.

Above all, ample room should be left for group and team games. The arrangement of apparatus around the border suggested for the girls' area applies equally well to the boys', leav-

ing room for such games in the center. Usually there is sufficient space for laying out volleyball and basketball courts. The regular basketball court is much like that for the line game described above. The ideal size court for this game is smaller, however, measuring seventy feet by fifty feet. Sixty feet by thirty-five feet constitutes the minimum size. Many playgrounds are not large enough to allow for a regulation baseball field, but if only younger boys are to use it, a diamond with sixty-foot base-lines may be laid out. A soft ball should be used for this game, instead of the regular hard baseball, and in no case should activities be carried on in line with a batted ball. If, because of lack of space, it is necessary to play basketball or volleyball on the baseball diamond, removable posts should be used. In this case fixed sockets with some system of caps should be built in flush with the ground to hold the posts upright.

If possible, it is well to provide a jumping-pit and a straightaway running-path, fifty to 100 yards in length, for the boys' area.

In some cases it is possible to lay out an athletic field adjacent to the playground, providing a regulation baseball diamond, circular running-track, tennis courts and other athletic facilities. Suggestions for laying out such fields are given in Chapter V.

Toilets

Unless the playground is immediately adjacent to a school or other buildings with available toilet facilities, toilet-rooms should be provided. These should be well ventilated and of perfectly sanitary construction and equipment.

Drinking Water

Drinking water should be supplied by means of sanitary drinking fountains.

Shelter Buildings

Shelter buildings of pavilion-like nature, capable of holding many people in time of sudden rainstorms, are most desirable. These buildings may contain offices and storerooms, lockers, toilets and shower-baths and oftentimes an indoor game-room. The office should be so arranged that a director whose duties call him to the office may still keep an eye on the playground. Buildings are most advantageously placed on the dividing line between the boys' and girls' sections or in the corner of the ground, thus leaving the maximum amount of space for games.

Accessories

The playground should be provided with a flagpole which will fly not only the American flag but also a distinct playground flag. Bulletin-boards should be placed at the entrance of all play spaces, upon which may be placed rules and

announcements. A first-aid equipment should be accessible at all times. A repair kit will be found of value for mending balls. In some cases the balls and equipment are mended through the organized effort of the children attending the playground. In large areas water-taps should be placed at regular intervals, so that a hose may be attached for sprinkling all parts of the playground in dry weather.

Lighting

To secure its maximum use, the playground should be well lighted at night. Electric light wires should be carried underground, as those carried overhead interfere with activities and are more dangerous.

CHAPTER III

Discussion of Common Types of Playground Apparatus and Suggestions for Their Use

THE following material, which brings together the opinions of many men experienced in playground work, in regard to the selection, care and use of various pieces of apparatus, will be helpful to committees and Boards which contemplate the laying out and equipping of playgrounds:

The Sand-Bin

The sand bin, sand box or sand garden, as it is sometimes called, is of primary importance for the small children's playground. Good dimensions for this bin are twelve by sixteen or twenty feet, with the sand bed eighteen inches deep, enclosed on four sides by either cement or plank walls twelve to fourteen inches high. It is sometimes made collapsible with malleable-iron side and corner fittings. The sand should not be placed upon a clay surface, but upon some porous surface, so that water may seep through. Excavation made to a three-foot level and filled in with loose cinders will provide drainage when the sand is watered. If it is enclosed in a cement

court with a cement bottom, a drainage system should be supplied. Wherever possible beach sand should be used, and every effort should be made to keep it in, not only a sanitary condition, but a condition which invites sand play and modeling. It should be raked thoroughly every day, turned over and exposed to the sun and air, washed with water and kept moist, so that it will pack readily. Sprinkling with a thin solution of bichloride of mercury will insure against fleas. The sand should be changed at least twice a season. Where used by large numbers of children it should be changed as often as once a month. The old sand can usually be used to advantage under the apparatus and in filling in the jumping-pit. It is suggested by one authority that there be two sets of sand bins used alternately by the week. When one set is in use the other may be purified. If possible, it is well to have, besides the large sand pile, a number of smaller ones, say five feet by five feet, which can be given to individual children by the week, day or hour. One sand pile should be kept dry for the very small children who like to bury themselves in the warm, dry sand. There may well be a wide board or plank running around the top for use as a seat and for moulding the sand.

The Wading-Pool

Wading-pools may be made by excavating a specified area, constructing a cement basin and

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placing at the lowest point a drain that may be opened and closed at will. At the same point bring in a supply water pipe, letting the same extend a little higher than the grade line of the playground. A sand trap is necessary to prevent the clogging of drain pipes.

Such pools are usually circular in form, about forty or fifty feet across with water five inches deep at the edge and eighteen inches deep in the centre. The thickness of the concrete walls will depend somewhat on the climate. Southern pools need no more than four inches; northern climates demand heavier construction and reinforcement. The top of the side walls should slope outward so rain and drippings will drain away from the pool. Although considerably used the circular pool is apt to be more expensive than the straight-line shape because of the difficulty in making concrete forms. A *hexagonal* pool with three south faces developed with sand-court and pergola is suggested as having all the advantages of the semi-circle as to shade, with much lower cost of construction.

The water should be let out of the pool every few days and the empty pool permitted to bake in the sun. These pools should be used only for paddling and wading and not for swimming.

The Slide

The slide, which is now found universally on children's playgrounds, consists of three parts—

the chute, the stairway and the supporting structure. It is felt that stairways are better than inclines for slides and that slides should be constructed in one piece. A waist-high railing under which the child swings to get his position on the slide prevents accidents and forces users to the proper position at the start of their descent. Slides may be built of either maple or steel. If maple is used—and many consider it more satisfactory—it should be waxed occasionally. The maple slats should be slightly beveled at the edges and be set about one-sixteenth of an inch apart to allow rain to run off readily and to provide for the expansion of the wood when wet. Slides of steel and wood may be purchased in various sizes. The slide made of three-sixteenths inch steel is suggested as giving good service. A slide six feet high and two feet broad is large enough for the small children. A ten-foot slide may be selected for the older girls and a twelve-foot slide for the older boys. It has been said that cost, maintenance, safety, order and service argue in favor of the low and short slide in preference to the high and long one. Children should not be allowed to slide down in a standing position or to walk or crawl up the chute.

The Swing

Hammock swings are sometimes provided for babies brought to the playgrounds by their mothers. Chair swings are enjoyed by children

between the ages of three and six. The older children should not be allowed to use them.

The most serviceable swings for older children are those having steel framework or a frame made of ordinary gas pipe. Three-inch medium pipe, with three-and-one-half-inch horizontals, may be used, or two-inch uprights and two-and-one-half-inch horizontals, if extra-heavy pipe is used. The uprights should be set four feet in concrete. Frames are constructed in such a way as to have two to eight swings, according to their length.

For the small children's playground the swings probably ought not to be more than eight or ten feet high. About three and one-half feet will be required for each swing. For the older boys and girls twelve to fourteen feet is a good height. Such swings will require about four feet each.

Two precautions should be taken in building or purchasing swings. The collar about the pipe, which holds the rope or chain, should be so made that it will grip like a vise, as it has to bear the strain of the swinging. The hook that holds the chain or rope should be made of tempered steel, which is both hard and tough, in order to prevent its wearing through. The friction is often reduced considerably by having the swing work on ball-bearings. All hooks and rings should be greased once a week with axle grease.

The swings may be suspended by rope or steel chain. If of rope, and many feel this to be better

than the chain, hemp will be found more practicable than manila, which must be shrunk before using. Russian boat rope is very serviceable, but difficult to secure at present. The steel chain generally chosen is that with links about a foot long. Swings with ball-bearings and steel links may be chained to the uprights. Rope swings are usually hung on hooks and taken in at night.

The swing board should be as light and soft as possible and only a little longer than the width of the child. Hard maple or soft pine may be used. A board seat, without projecting bolts and nuts, with the edge, front and back covered with rubber hose (screwed on), will reduce accidents to a minimum. The approved method of attaching the board to the rope or chain is to have a clamp go around it, terminating with a stirrup strap and eyelet of steel in which the rope or chain is fastened.

To prevent holes made by the children's feet underneath the swings a board or cement floor about three feet wide is sometimes constructed. Woodblock construction has also been used for this purpose with good results. To avoid accidents, two children should not be allowed to occupy one swing-seat. Pushing and running under the swing and pushing by holding on to the feet of those who are swinging should be prohibited.

The See-Saw

Everyone is familiar with the see-saw as a piece of play apparatus. The longer the see-saw board and the lower the standard the safer it is. See-saws are often constructed with safety bumpers, which keep the lower end six or eight inches off the ground and help to prevent any squeezing or pinching of limbs. It is best to use the see-saws with handles so that the children may have something to hold on to. It is suggested that by making one's own see-saw boards, freight may be saved and a reserve replacement supply kept. A clause may be included in the specifications sent to manufacturers for bids, providing that only necessary hardware and fittings be provided, with blue-prints, specifying type of board to be used. Children should not be allowed to stand on the end of the see-saw or to work it alone from the middle.

The Giant Stride

The giant stride consists of a tall pole, its total length being from fourteen to twenty feet. It is usually made of steel pipe about five inches in diameter and set about four or five feet in concrete. The head is set on the top of this pipe with ball-bearings, and attached to this revolving head are six rope or chain ladders which have three or four short rungs. The rope ladder is more pleasant to hold on to, but the steel ladder lasts longer. If steel ladders are used, filling the

upright pipe with material to deaden the sound of the chain knocking against it is a great improvement. The most common method of locking the stride is to chain the ladders to the post. Children should not be allowed to push anyone around, take a twist or tie the ropes together. They should be taught, also, to dodge out of the way as soon as they drop off the stride to prevent their being hit.

Athletic Equipment

A hard baseball cannot be used on an ordinary playground where other games must necessarily be carried on at the same time. The handball, volleyball, indoor baseball and the outer-seam soccer ball are probably the only types of balls necessary for the games generally played on the playground. The soccer ball may be used for basketball, football, dodgeball and captainball.

For prolonging the life of certain types of athletic equipment the following suggestions are given:

Inflated Balls—Find the spot where the ball has been sealed, which is usually a hard piece of rubber on the inside and can be found by pinching the ball. By inserting a hypodermic needle into the end of an air bulb and forcing the needle through this rubber, which the manufacturer has used to seal the ball, enough air can be forced into the ball to make it better than new. After removing the needle, pinch the rubber seal to-

gether, which again seals the hole made by the needle. In this way balls may be made to serve until the rubber cracks or splits. Rubber balls may be treated in this manner.

Basketballs, Soccerballs and Volleyballs — When a new basketball, soccerball or volleyball begins to rip in the seams have a harness-man handsew the entire ball. Use waxed linen cords for this. It may be done with either the outside or inner seam ball. After a ball gives way at one point it is not long before it gives way at another, and in the end more is spent than it costs to have it all handsewed when the first rip appears. The length of life of such balls can be considerably prolonged by treating the cover with Neatsfoot oil before putting in use, or whenever the leather shows signs of chafing or drying out. One authority gives the following suggestions for lacing balls:

Ball Laces—Many leather laces are ruined because they are not properly laced into the ball when new. Never tie knots in a leather lace. Before inserting the lace into the ball cut a slit in the wide end of the lace just long enough to pass the other end through. Lace through the end hole, so that this slit comes underneath the flap. Then pass the needle end of the lace through this slit and pull tight. This method insures a proper start for lacing the ball, and also will never pull out as a knot will, and cannot slip through the eyelet. Such a lace can easily be

removed at will. Round shoelaces answer as a lace for canvas basketballs and volleyballs. Belt-lacings split into the proper widths and lengths are the best for basketballs and soccer footballs.

Jump-Ropes—The life of a jump-rope can be prolonged by winding the center or part that touches the ground with tire tape. This also makes the rope turn easier, as it adds weight to the center.

Hockey-Sticks—Sticks can be made to last a good deal longer by winding the neck with tire tape. Splintering reduces the length of life of the stick.

Indoor Baseball Bats—In some cases, where the throwing of a bat after having hit the ball is not only dangerous but noisy, it has been found practical to turn down the ends of the bat so that a large size rubber crutch tip can be forced on. This prevents the bat from slipping out of the hand. The handle of the bat should be covered with tire tape.

Contracts for Purchasing Apparatus

In securing quotations from manufacturers, bid forms are of value. A suggested form is given in the appendix.

It is best to always make use of a carefully prepared contract in purchasing apparatus. This should contain the following items:

1. When and where delivery shall be made and who is to pay for same.

2. The erection and connecting of all parts of the apparatus after it has been delivered.

3. If cement is used as a foundation or anchorage for apparatus, let the contract state who is to be responsible for the excavation and cement work.

4. Insert a clause to cover extra or incidental expenses.

5. Do not fail to include a clause that will safeguard you or your community against troubles with labor unions.

6. Let there be a clause of guaranty on the part of the manufacturer against defective material, faulty construction and workmanship. Make this guaranty cover a period of at least three years.

A list of manufacturers of playground apparatus, athletic equipment and supplies may be secured from the Playground and Recreation Association of America, 1 Madison avenue, New York City.

Organizing Volunteers

It is suggested that however elaborate the equipment, or ample the funds, all playground apparatus should be installed with an instructor on the job, enlisting local boys in helping in its placement and the labor of getting it into condition for use. This voluntary service offers opportunity for the instructor to get acquainted, and gives the boys a sense of proprietary interest

in the result. It short-cuts the long and tedious development of a sense of ownership, and of belonging, by weeks and probably months of painstaking effort.

It is well, also, to co-operate closely with the manual training classes of local high schools, enlisting them in the making of benches, wands, dumb-bells and wooden blocks for the small children's use. These possibilities have been too largely overlooked, due more to oversight than intention.

CHAPTER IV

Home-Made Apparatus

BECAUSE of the great use to which it is put in large cities and the pains which must be taken for safety and freedom from vulnerable points for lawsuits, playground apparatus is usually purchased under contract from manufacturers. In small towns or rural districts, however, it is often made on the ground by a local carpenter. Sometimes the children in schools or other institutions having a manual-training department construct the equipment for their own playground as a part of their work.

In the construction of all apparatus, however, special attention must be given to the friction points and all such apparatus as swings, flying-rings and traveling-rings should have special bearings at these points. Those building their own apparatus may be interested to know that the Narragansett Machine Co. manufactures a "rocker-bearing" the A. G. Spalding and Bros. a ball-bearing device and W. S. Tothill a bearing of hard maple revolving or sliding over an iron rod, all of which give good service.

Baby or Chair-Swings

The following suggestions are given by one playground authority for constructing baby or chair-swings: Make two long saw-horses about six and one-half or seven feet high, underneath measurement, with a wide spread at the base. Hang five chair-swings on each horse. Each swing is a foot square and one and one-half feet from the next swing. Then put two horses side by side just far enough apart so that when opposite swings are flying they cannot touch one another. Run cross-pieces over the tops of these saw-horses and cover with canvas or cheap unbleached muslin. Of course, have this roof project a little beyond the saw-horses to keep the sun from striking under. Sash-cord is strong enough for the ropes. Hooks that screw in answer for the top, with horse-rings to hang the ropes to. Four pieces, one foot by one inch by two inches, form the railings, which are hung on ropes the right height above the one-foot-square seat. The whole thing is too small for big people to get into, and is easily taken in at night without a ladder. It is so cheap that you can have twenty or thirty, and they can be easily covered with canvas. The sides of the saw-horses also project so that it often warns careless little people, coming from the sides, against running in front of the swings.

The specifications given below for the construction of various types of home-made appa-

[*Thirty-seven*]

ratus were printed in a rural recreation manual, "Neighborhood Play," published by the *Youth's Companion* in co-operation with the United States Bureau of Education.

Materials

Number 1 spruce or Southern pine is excellent material for most playground apparatus. White ash has the advantage of added strength, but it splinters easily. White oak should be used for pieces that receive much wear—such as swing boards and turning bars. All wood should be carefully seasoned, and such parts as come in contact with earth should be tarred or treated with creosote.

It is well to saturate the wood thoroughly with boiled linseed oil. In any case, it should be finished with two coats of good outdoor paint, preferably dark green in color, or with one coat of shellac, followed by one coat of the best spar varnish.

Sand Box

The desire to play in the sand is universal, and for little children the sand box or sand table is the piece of playground apparatus that brings the largest returns. But place it out of the way of stray balls and other similar dangers.

A good size for the box is five feet by ten feet. First remove the sod from an area of those dimensions, and if the natural drainage is poor, replace the top layer of soil with gravel. Procure two boards fifteen feet long and eight inches wide, a new nails and a joist, two by three inches and eight feet long. Saw the joist into pieces two feet long, sharpen the ends and drive them into the ground sixteen inches at the points that are to be the corners of the box. Nail the boards to

[*Thirty-eight*]

the corner posts so as to form the sides and ends; and if you wish, level the tops.

The apparatus is complete when you have hauled in the load of sand, preferably of the grade known to dealers as "fine beach." Be sure it is free from stray cats and dogs; it is well to place a woven wire fence four feet high about the box.

To make a sand table, construct one or more boxes, eight inches deep, of any desired size, preferably not over three by six feet. Build a strong table to support the boxes, about twelve inches above the ground.

Swing

Ordinarily, a branch of a tree, a rope and a board are all that is needed to make a swing; but when the tree is not conveniently present make a strong simple frame of two posts set in concrete and a crossbar at the top. If you tie the rope to the crossbar, or to hooks placed in it, the rope will soon wear through. A better way is to place eyebolts, two to three inches apart, in the crosspiece. Into the eyes insert a two-inch galvanized-iron pipe, with holes drilled two inches from each end; place oxbow pins in the holes to hold the pipe in place, and tie the rope to the pipe.

Horizontal Bar

For the bar itself a galvanized-iron pipe, carefully sand-papered, two inches in diameter and six feet long, will serve as well as the more expensive and less durable wood. Two inches from the end of the pipe drill holes five-eighths of an inch in diameter. For the supports, use posts four inches square and nine or ten feet long. Six inches from one end of each, exactly in the centre, bore a hole two inches in diameter. To intersect this hole at the centre at right angles, bore another one-quarter of an inch in diameter.

Set the uprights in concrete. Dig holes for them
[*Thirty-nine*]

three feet deep, six inches or more square. In a tub, or some other convenient receptacle, mix one shovelful of Portland cement, two shovelfuls of sand and four of coarse gravel or small stones, with enough water to make a watery mud pie. When the cement has been thoroughly mixed, pour a little of it into the bottom of the hole, then put in the upright and pour the rest of the cement round it. See that the upright stands plumb and leave it undisturbed for forty-eight hours, by which time the cement will have hardened.

In placing the other upright, remember that the horizontal bar must not belie its name. Probably you will have to experiment several times with the depth of the foundation layer of concrete before you fix the upright at just the right height above the ground to make the bar horizontal. Place the post with the large hole pointing toward the other post. Pour the concrete as before. When it has hardened for forty-eight hours, put the bar in place through the holes and bolt it there with quarter-inch carriage bolts. You can set both posts and the bar the same day; but the slower method described above will give better results.

If you wish a removable crossbar,* use a pipe six feet six inches long, and arrange the fastening as directed in the description of the teeter, which follows. With the bar removed, the uprights can be used as a jumping standard. To hold the string or stick over which the contestant jumps, drive three-inch nails one inch into the side of the uprights. Always jump from the side of the uprights opposite to that in which the nails are placed.

An adjustable bar can be arranged by piercing the uprights with as many holes as you want, and fastening the bar in place as directed in the description of the teeter.

See that the children who use the bar have a soft

place in which to land. Sand will save injuries and prevent mud puddles from forming.

Teeter

A board over a fence or a rock is a teeter, but a better one can easily be made. For the uprights get two pieces of five by five inch joist five and one-half feet long. Four inches from one end of each piece bore a two-inch hole. Have ready a piece of galvanized-iron, two-inch pipe two feet long, with a cap on one end and a three-eighths-inch hole drilled two inches from the other for an oxbow pin. You can use another bow pin instead of a cap, or can substitute carriage bolts for both, or can drill holes through pipe and wood and bolt the pipe in place as you do the horizontal bar; but the first suggestion is the simplest, since it permits the easy removal of the pipe.

Dig holes, with their centres eighteen inches apart, three feet deep, six inches square. Set first one upright, then the bar, then the other upright, as directed for the horizontal bar. Be sure to allow the concrete sufficient time to harden.

The plank should be fourteen feet long two inches thick and ten inches wide; to keep it in place upon the pipe, bolt to it on the under side two crosspieces of hard wood, each two inches square and ten inches long. For the carriage bolts that are to hold these crosspieces in place, bore four holes, each six feet nine inches from each end of the plank and three inches from the edge. Pad the ends of the plank, to form a protection from sudden jars.

The teeter is so popular and so liable to abuse that the plank should generally be taken in every night; and the bar removed when the playground is to be closed—officially—for more than a few days.

Giant Stride

The basis for a cheaply and easily constructed giant stride is an old wagon wheel and a pole eighteen feet long and five inches in diameter at the small end. In almost any village the wheel can be had for the asking, and the pole probably can be cut in the woods.

If you use a wheel with a wooden axle stub, remove the axle from the skein, which is the "tapering metal sleeve surrounding a wooden axle spindle to protect it from wear." Shape the top of the pole to fit into the axle skein, and fasten the skein securely in place.

If you use a wheel with a metal axle, cut off the axle about a foot from the hub, and sharpen it to a point. Here is where you may have to call upon the blacksmith. Cut off the spokes four inches from the hub. Into the middle of the small end of the pole bore a two-inch hole about six inches deep, and drive the axle in to it. If the blacksmith is helping you, have him shrink an iron collar on the end of the pole, to keep it from splitting. It is well to use an all-metal wheel and axle.

Cut sixty feet of one-inch Manila rope into four equal pieces. With copper wire, or by splicing, attach the ropes to the hub. Knot them at the bottom, and about every two feet for the lower eight feet. After it has been hung in the sun and rain until it has stretched as much as it will, apply a thin solution of pine tar to preserve it.

Set the pole in concrete, four feet in the ground. At that height, the lower knot of the rope should clear the ground by about two feet. It is well to place a tin or other waterproof cover over the hub, if it is exposed. The entire wheel may be used, and the ropes tied to the felly; the result is a lengthened flying stride, but an increase in danger. . . .

Working drawings, which will be found helpful in constructing apparatus, may be found in "Playground Technique and Playcraft," a book by Arthur Leland, published by Doubleday, Page & Co., at \$2.50; and in Chapter VIII of "Play and Athletics, Bulletin No. 1842," published by the University of Texas, Austin, Texas.

Other forms of apparatus which require almost no expense for construction, installation or maintenance are the jumping-pit, balancing-tree, hillock, climbing-tree and jumping-stairs described by Dr. E. H. Arnold.

Jumping-Pit

This consists of an excavation ten or more feet wide, thirty or more feet long, three or more feet deep at one of the narrow sides, running from this depth diagonally upward to the upper edge at the other narrow end. The sides of the pit are made secure by stout planks, properly prepared to withstand moisture. The ground around is well evened up. The bottom of the pit is free from stones and covered with at least six inches, if possible more, of good sand. In this pit babes may enjoy the sand play. Deep jumping from the sides at various heights into the sand is enjoyed by the smaller children. For broad-jumping, standing and running it is excellent. The first attempts at pole-vaulting may be made from the edge of this pit. With some assistance tumbling may be done from the edges into the pit.

Balancing-Tree

The balancing-tree is a large and perfectly straight tree, fifty or more feet long, freed of the bark and rounded off. It is supported by two or three wooden feet, one at the extreme

thick end, the other one sufficiently far from the thinner end to allow the thin end free play to swing. At the thicker end the tree may be two and more feet in diameter. It tapers to an end of four or six inches in diameter, which is free to swing. The tree is so supported that at its thicker end its upper edge would be three to three and one-half feet from the ground. The tree is then placed securely on its feet so that its long axle is horizontal. This tree, as its name implies, gives a chance for balancing exercises on a broad and steady and also on a more and more narrow surface, which sways and swings. It may be used for deep jumping, for vaults of all kinds. In the more solid parts of the tree holes may be drilled and pommels may be fastened on it; then we have it serve all the purposes of a horse or saddle-boom. Children may ride on it astride, may swing on the movable part, and should in that position find great enjoyment.

Hillock

The hillock consists of a small elevation on the playground, two to five feet high, from three to six feet wide at the base, tapering off toward the top, well covered with turf. Deep jumping, high jumping and hurdling may be done on and off and over this. Pole-vaulting may be taught from it. This gives opportunity for the much-enjoyed frolic, rolling of children. In winter, when it is covered with snow, it gives a fine

start for the sled. It invites war games for the possession of the top of it.

Climbing-Tree

The climbing-tree is a straight tree no less than thirty feet high, made smooth, but not necessarily altogether even, securely implanted. Its top is protected by a platform sufficiently wide not to allow its edge to be grasped by the climber. While this apparatus serves climbing primarily, until the ingenuity of the child makes it the center for other games, it furthers that type of climbing which is the normal and natural one, and which can be practised only on trees and for which the gymnasium climbing-pole gives no chance at all. Two of these may be made the end-supports of the playground swings.

Jumping-Stairs

These are wooden stairs of ordinary construction, leading with ten or twelve steps to a height of from six to eight feet either to a platform, or, better, to stairs of the same type, leading down on the other side of the platform. If the sides of this are inclosed by boards and a door cut in, it may be made the receptacle for playground hand apparatus. These stairs are surrounded on all four sides with sand of at least six-inch thickness. Anyone who has ever watched the great fondness of children for jumping from stairs will know that the installation of this apparatus

is only half completed before the children are beginning to make use of it for broad, high and deep jumping. It may once more be used to start pole-vaulting. Some tumbling may be done from it. On the solid side of it targets may be painted. The sand around it gives a good place for the sand play of small children, but also for a free bout of friendly wrestling of boys.

Leaflet No. 42 issued by the Junior Red Cross, 44 East Twenty-third street, New York City, gives helpful suggestions on the construction of home-made apparatus.

CHAPTER V

The Athletic Field

General Considerations

Athletic fields, providing tennis courts, running-track, baseball and football grounds, a field-house or locker-building, and sometimes a swimming-pool, must oftentimes, because of the space necessary for their development, be placed at a distance from the regular playground. Since they are generally used by the older youths and adults, they will serve a territory of a mile or more in radius and may be located on or near main thoroughfares. Five acres constitutes the minimum area for such fields. Many will wish to make use of the field at night, and arrangements should therefore be made for lighting.

Surfacing and Orientation

Two points which must be given particular consideration in laying out ballfields, running-tracks and game courts are surfacing and orientation. The points on surfacing given in Chapter I hold generally for athletic fields, as well as playgrounds. As most games are played in the afternoon, and as the low sun is the most

troublesome, it is best to run the long dimension of the field north and south in games like football and tennis, where the playing is up and down the area of play. Opinions differ regarding the baseball field, and circumstances often make certain arrangements necessary. Probably the best arrangement, however, is that of having the line between home-plate and first-base run north and south.

Marking Courts

Boundary lines should be plainly marked. White-linen tape fastened to the ground with wooden pins is often used, but it is not now as popular a method of marking as with white-wash or wet lime. Dry marks may be made with marble dust, slaked lime or a mixture of two parts sand and one whiting. Roller-markers for making wet or dry marks may be purchased. Mr. Paul Williams suggests, in an article on the construction of tennis courts, a stencil for applying whitewash which may be made in case a marker is not available. This consists of two light boards about three feet long placed parallel to each other with an open space between them the width of the line; a handle may be put on one end for convenience. With an old broom as a brush, the lines may easily be gone over and fairly good results obtained. A sprinkling can with the spout flattened down, leaving only a

small opening, is sometimes used for a tennis marker.

*The Baseball Diamond**

The regular game of baseball with a hard ball is played on a level field, preferably not less than 325 feet square, in which the "diamond," or infield, ninety feet by ninety feet, is outlined obliquely to the boundaries of the larger field. The "home-plate" is usually made of whitened rubber, five-sided, measuring twelve inches along the lines of the diamond from the angle, seventeen inches across the front and eight and one-half inches from the twelve-inch lines to the forward line. It should not be closer than ninety feet to the grandstand. The first, second and third bases measure fifteen inches by fifteen inches and run to the right from the "home-plate."

The "batter's box" consists of an oblong enclosure, six feet by four feet, drawn six inches from the "home-plate" on each side. The pitcher's plate is of whitened rubber, twenty-four inches by six inches, placed practically in the center of the diamond on a gradually sloping mound not more than fifteen inches higher than the home-plate. The catcher's place is in a triangle drawn immediately back of the home-plate

*Description of fields taken from the "Handbook of Athletic Games," by Bancroft and Pulvermacher, published by The Macmillan Co., 64 Fifth Ave., New York City.

by extending the lines of the diamond and connecting them with a line ten feet from the point of the plate.

A high-board or wire fence erected ninety feet back of the home-plate serves as a backstop. It is suggested that time is saved in amateur games by having the backstop about thirty feet from the home plate instead of the regulation ninety feet.

The foul lines are made by continuing beyond first and third bases to the edge of the playing enclosure the lines of the diamond running forward on either side from the home-plate. The "three-foot" line is drawn parallel to the diamond from home to first base for the latter half of it and three feet from it. Coachers' lines are drawn off first and third bases toward the home-plate, fifteen feet from the outline of the diamond parallel to the four lines.

Benches for players are placed back of the batter fifty feet from the diamond.

The Football Field

The football field consists of a rectangle, 360 feet by 160 feet, called, respectively, side lines and end lines. Ten yards inside of each end line is drawn a parallel line called the goal line, marking off the end zone. At intervals of five yards, parallel with these lines, other lines are drawn for an aid in judging distances. All lines should be very distinct, especially the boundary.

lines and the end, goal and twenty- and forty-yard lines.

A goal, consisting of two upright posts at least twenty feet high and placed eighteen feet six inches apart, with a horizontal crossbar ten feet from the ground, is placed in the center of each of the goal lines. For soccer, the goal posts should be twenty-four feet apart, with the crossbars eight feet from the ground.

The Hockey Field

Field hockey may be played in the football field. It needs a space 150 to 180 feet wide, 300 feet long and about a thirty-foot additional space behind the goal lines. Flags on posts four feet high are often put up to mark the corners and sides of the field. The field is divided into halves by a transverse line and each half divided by another transverse line twenty-five yards from the goal line. A cross is drawn in the center on the half-way line. The striking circle is made by drawing a line four yards long fifteen yards in front of each goal and parallel with the goal lines and connecting the end of this line to the goal line, with a quarter circle for which the goal post is the center. The goals consist of posts seven feet high, two inches broad and three inches deep placed twelve feet apart and connected by a crossbar. Each goal is provided with a net for catching the ball.

The Running-Track

Local conditions will usually dictate the shape and size of a running-track. A track of less than a quarter of a mile is not, however, considered desirable for important games.* A foundation of coarse stones, with six inches of clay, one inch of cinders and a top dressing of cinder dust is suggested as being dry and springy in wet weather and least dirty in dry weather. Considerable rolling is necessary and use will improve it.

In order to save space a circular track is often laid out around the ball diamond or football field. In that case it should be made without a curb so that the space may be played over. The long dimension is best arranged north and south.

With a quarter-mile track the usual width is fifteen feet on the curve and twenty feet on the straightaway. In laying out the track it should be remembered that the length of running-track is measured on a line eighteen inches away from the inside edge of the inner curb of the track. With this in mind drive stakes thirteen and a half feet from the outside edge. Measure carefully around the course thus marked out by the stakes and if it is found to be a few inches longer or shorter than a quarter of a mile adjust the stake

*Satisfactory dimensions for running-tracks for minimum areas are as follows:

4 laps to the mile, center line	267.3 ft.	Radii	125 ft.
5 " " " " " "	135.3 "	"	125 "
6 " " " " " "	116.4 "	"	103 "
8 " " " " " "	15.8 "	"	100 "

[Fifty-two]

at the north end so as to make it correct, which can be done by moving the straightaway a few inches north or south. If the straightaway is allowed to project beyond the curve of the track by a length equal to the length of one curve, the 440-yard run can be started at the start of the straightaway, and finished at the end of the back-stretch introducing only one turn into the race.

Within one end of the track there will be room for various "field events" such as the shot-put, high jump, broad jump, and pole-vaulting. Hammer-throwing should never be allowed within the track while track events are in progress. Running-paths for vaulting and jumping should be three feet wide and constructed like the running-track. Sand-pits must be provided for landing. Mixing sawdust with the sand or clay in jumping pits makes a much softer landing and also makes it easier to keep the soil loose.

Tennis Courts

There are various types of tennis courts, including courts of grass, asphalt, concrete and clay. A dirt court, when properly laid out and cared for, wears well and probably offers the best combination of durability, reasonable construction cost and upkeep expense. Space determines the number of courts which may be provided.

Surfacing is here a most important factor as there must be no humps or hollows if they can

possibly be avoided. One authority feels that for clay courts a pitch of six inches from back line to centre is necessary to solve the drainage problem. On the tennis courts in Grand Rapids a pitch of six inches from the middle to the end has been found satisfactory. Mr. Paul Williams, in his article on tennis court construction, suggests the following as the usual best method of building a dirt court: Cut away the earth to the depth of one foot; level carefully and be sure the grade is right. Put in about six inches of broken stone, the size of the stone ranging from two inches to one inch in diameter. Pound down very hard. Put on a three-inch layer of finely broken stone or crushed gravel. Pound this down and keep well watered for several days. Be sure and keep the foundation perfectly smooth and level. Now add the top dressing which should be from three to six inches thick. A mixture of sand and clay may be used for this. If the clay is sticky, use one part of sand to four of clay. Usually eight of clay to one of sand is the right mixture. A very soft court needs more clay; a sticky surface needs more sand. Water well and roll twice daily for two weeks before the court is used. Light raking, careful rolling and sprinkling will produce a firm surface free from hollows and humps.

Laying out the court is a simple process although it requires accuracy in measurement. A clear space sixty feet by one hundred and

twenty feet is required in order to leave room for the runways at the ends and sides. The singles court is twenty-seven feet by seventy-eight feet, while the doubles court is thirty-six feet wide. The net posts should be forty-two feet apart and to mark the court it is necessary to square the lines by these posts. Drive a stake three feet inside each post, these stakes being exactly thirty-six feet apart. Lay out one side line seventy-eight feet long, passing over one stake which comes at the thirty-nine foot mark or half the length of the side line. By making the distance from each end of the seventy-eight-foot line to the opposite stake equal, the side line can be squared and the other laid out in the same manner. It is then simply a matter of measurement to put in the service and base lines. The back stops should not be set so close to the court as to cut down open space. Wire netting carried on wood or steel posts is the material generally used for backstops. Most courts are marked with lime put on wet. Both grass and dirt courts should be rolled after being used but it is useless to do this until any inequalities in the surface have been repaired. This is particularly true with the dirt court. After it has been played upon, it should be dragged or swept, using a piece of scantling to weight down several thicknesses of burlap. This brushes out all the little irregularities and then rolling and sprinkling are in order.

Bleachers

The bleachers should be built of wood, in sections capable of being carried, so that they can be placed around the baseball field, or up and down the side lines of the football field. They should be put together with bolts so that they can be taken down and stored during the winter. The portable bleachers used on the San Diego, California, playgrounds, are put up in sections—each section holding eighty people. It is estimated that two men with a team can take twenty bleachers down and put them up again in half a day.

Field House

There are many different types of field houses varying greatly in size and cost. Some contain a library, clubrooms, game-rooms, a kitchen, restaurant, gymnasium, running-track and many other facilities. The Chicago and Seattle field-houses are noted for their beauty and usefulness. However, a field-house does not necessarily have to be large or expensive. The facilities which it should provide are toilets, shower-baths, an office, dressing-rooms, a locker-room, and, if possible, a recreation room. A comparatively inexpensive one-story field-house built in Racine, Wisconsin, contains a gymnasium, twelve shower-baths, toilets for men and women, a reading-room, kitchen and recreation room. Space has been economized by using the recreation

room as a dressing-room and having a sectional movable platform instead of a permanent stage. The locker-room contains a few steel lockers, but it is also fitted with pigeonholes in which are slipped wire baskets. This method has been found an economy of space and money.

The Playground and Recreation Association of America, 1 Madison Avenue, New York City, will be glad to furnish suggestions for the construction of such buildings, upon application.

The Swimming Pool

The swimming-pool is a playground in itself. Because of the number of points which should be discussed in considering its construction, full space cannot be given to it here. The question of size and depth will, of course, be governed by local conditions. Outdoor pools are usually of concrete and vary from seventy-five to one hundred and fifty feet long and from thirty to sixty feet wide. A long, narrow pool is preferable. The depth should not be more than four feet at the shallow end nor less than seven feet at the deeper end.

The following points must be given particular consideration in building swimming pools:

The relationship of the pool bottom and the sewer level ought to be carefully determined beforehand, so as to avoid the expense of pumps for emptying the pool.

Provision should be made for filtering and sterilizing the water.

There should be an adequate water supply and sufficiently large openings for rapid supply and escape in the pool.

A hose connection should be provided with hot and cold water for use in washing the pool.

Adequate shower-baths and bath-houses should be supplied and an office should be provided for the swimming instructor.

Helpful suggestions on the construction and care of swimming pools are given in the following pamphlets:

"Swimming Pools," by V. K. Brown and S. K. Nason, price 15c., and "Some Notes on the Construction and Administration of Swimming Pools," by Joseph E. Raycroft, price 20c. Both pamphlets are published by The Playground and Recreation Association of America, 1 Madison Avenue, New York City.

Conclusion

In closing, it may be worth while to point out the fact that a fully-equipped playground cannot be of any great use unless it is properly maintained. Ample funds should, therefore, be provided for upkeep and operation. "To spend a great deal of money for playground equipment and little for maintenance and operation is like saving at the spigot and wasting at the bung-hole."

APPENDIX

A suggested form for securing bids from manufacturers of apparatus is given below. Bid forms should specify that the manufacturer making quotations will provide any or all of the items, and the requirements should be itemized in standard terms and specifications.

SUGGESTIONS FOR PROPOSAL FORM

PLAYGROUND APPARATUS

The undersigned hereby propose to furnish any or all of the following listed playground apparatus, as described in our Catalogue No. —, together with blue prints and instructions for setting up same, at a price named after each item (a) including all parts and fittings, but not including pipe for frame, and (b) at a price named to include parts and fittings together with all necessary pipe for frames of our standard galvanized quality. Prices quoted are guaranteed for a period of —. Terms, —% discount, — days, and in case entire order is placed with us, the total is subject to the following discount —. Prices quoted are F.O.B. —. Should entire order be placed with us we guarantee freight charges to — will not exceed the sum of — on the entire shipment. Delivery to freight office is guaranteed to be made within — days after receipt of order:

A. Travelling Ring Outfits

Each to consist of outfit described on page — of our catalog, chain suspension, six rings.

Price: (a) without pipe \$ — each; (b) including pipe \$ — each.

B. Giant Strides

Each to consist of our standard outfit described

[Fifty-nine]

n page—— of our catalog, chain suspension,
t least six hand-ladders each.

Price: (a) without pipe \$—— each; (b) in-
cluding pipe \$—— each.

C. Standard Swing Outfits

Each to consist of our swing described on page
—— of our catalog, six swing seats to the out-
fit, chain suspension.

Price: (a) without pipe \$—— each; (b) in-
cluding pipe \$—— each.

DBaby or Box Seat Swing Outfit

Described in our catalog, page —— . Eight (8)
seats, chain suspension.

Price: (a) without pipe \$—— each; (b) in-
cluding pipe \$—— each.

I See-Saw or Teeter Outfits

Described in our catalog, page —— . Includ-
ing all attachments and fittings, but not including
the boards. Measurements and instructions for
having the boards made locally to be included in
blue prints which we agree to provide; each out-
fit to consist of attachments and parts for ——
boards as listed in our standard equipment.

Price: (a) without pipe \$—— each; (b) in-
cluding pipe \$—— each.

F. Playground Slides

Described on page —— of catalog. Each to
be 16 feet maple bed slide, complete with all
necessary parts, approach ladder, supports, etc.

Price \$—— each.

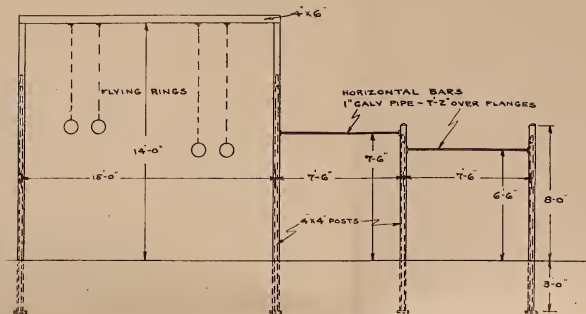
G. Combination Frame for Boys

Drawing attached hereto showing suggested
arrangement; all necessary parts and fittings of
our standard equipment; outfit consisting of two
(2) adjustable teeter ladders; two (2) horizontal
bars adjustable height; two (2) climbing poles;
one (1) slanting ladder and set sliding poles;
and two sets chain suspension flying rings, one
high and one low for different aged users.

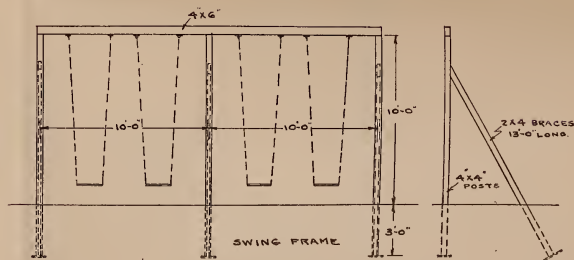
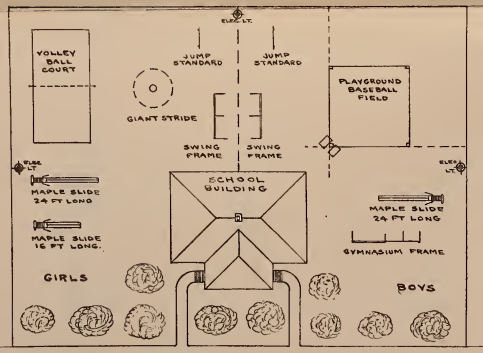
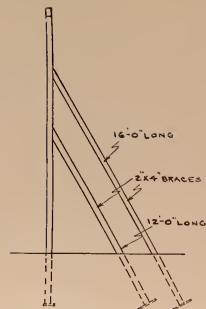
Price: (a) without pipe \$——; (b) includ-
ing pipe \$——

Respectfully submitted——

By——



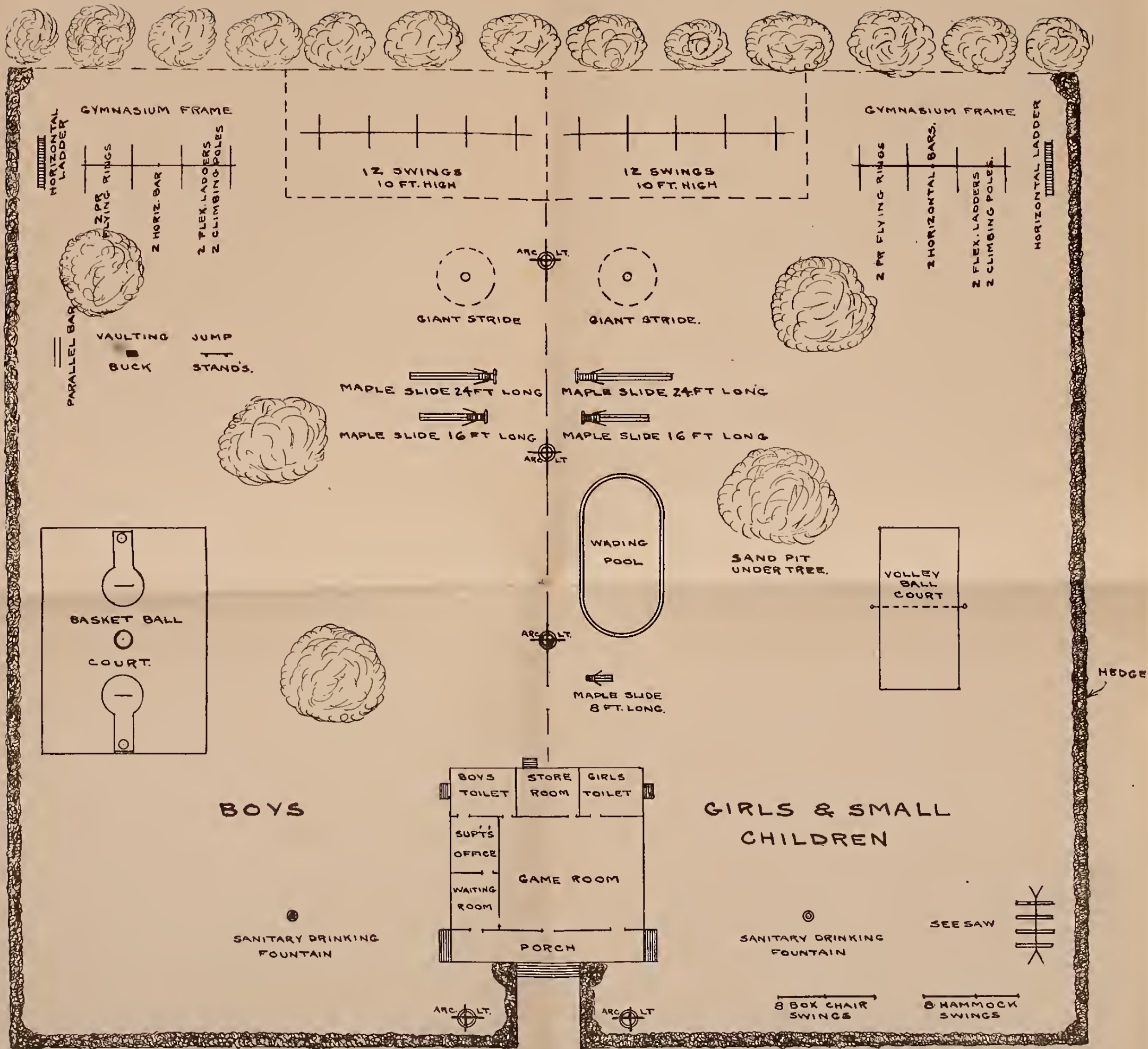
DETAIL OF GYMNASIUM FRAME

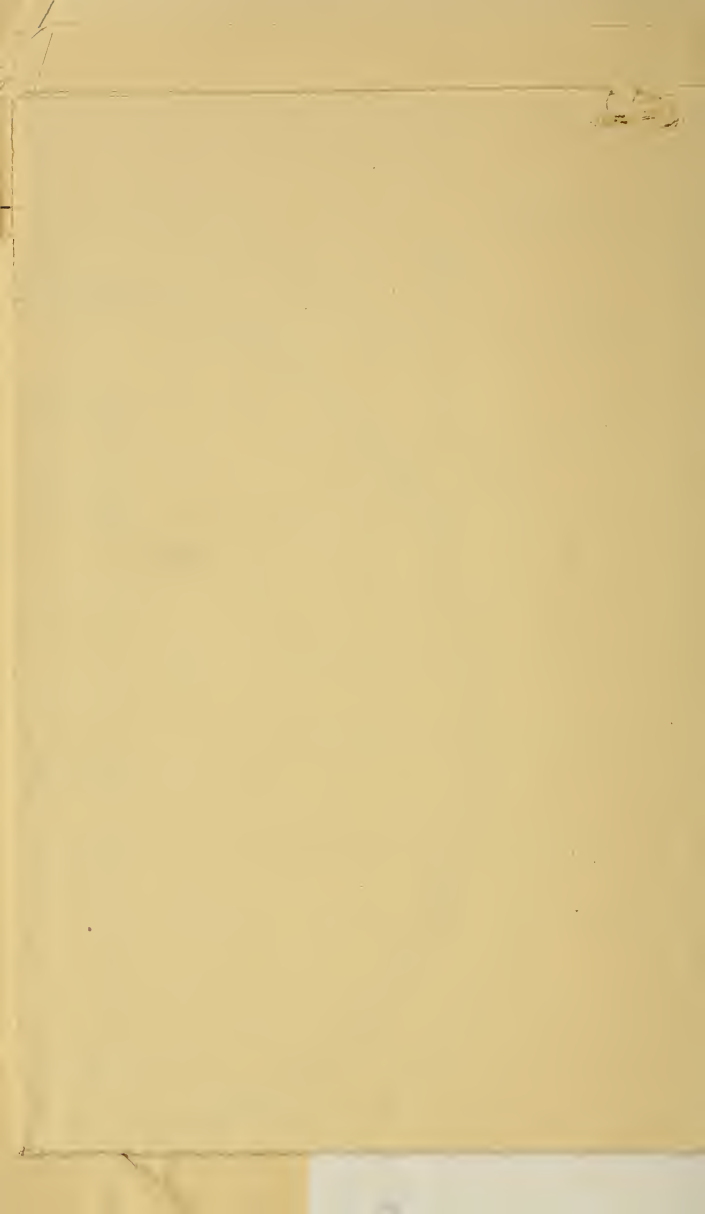


Scale: 1 Inch—54 Feet

PLAYGROUND PLAN NO. 1

PLAYGROUND AND RECREATION ASSOCIATION OF AMERICA
1 Madison Avenue, New York City







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